

The invention claimed is:

1. A method of assembling a selectively sized and configured pleated unit filter medium and a border frame which incorporates thermobondable materials comprising:

heat softening selected opposed edges of at least one thermobondable pleated unit filter medium layer;

compressing said opposed selected edges of said pleated unit filter medium into substantially flat border edges;

mounting said unit filter medium onto a compatibly sized and configured thermobondable flow-through border frame having selected filter medium support edges to receive and support said compressed border edges of said unit filter medium in facing relationship therewith; and

thermobonding said facing edges of said unit filter medium with said border frame.

2. The method of assembling the unit filter and border frame of Claim 1 wherein said step of compressing comprises compressing said edges of said pleated unit filter medium to form said border edges of said pleated unit filter medium such that said border edges have a depth/width coordinated with the depth/width of the pleats of said pleated unit filter medium.

3. The method of claim 2 wherein said border edges have a depth/width less than depth/width of the pleats of said pleated unit filter medium.

4. The method of assembling the unit filter and border frame of Claim 1, wherein said heat softening of opposed select edges of said filter medium is accomplished by a heating source within a selected temperature range.
5. The method of assembling the unit filter and border frame of Claim 4, wherein said temperature range is approximately 150°F to 525°F.
6. The method of assembling the unit filter and border frame of Claim 1, wherein said thermobonding is accomplished by ultrasonic welding.
7. The method of assembling the unit filter and border frame of Claim 6, wherein said ultrasonic welding is at a frequency of approximately 20 kilohertz (khz).
8. The method of assembling the unit filter and border frame of Claim 1, wherein said thermobonding comprises a preselected pattern of varied spacing.
9. The method of assembling the unit filter and border frame of Claim 8, wherein said thermobonding spacing is in gaps in the range of approximately 0.05 to 0.3 inches.
10. The method of assembling the unit filter and border frame of Claim 1, wherein said border frame is of selectively layered chipboard.
11. The method of assembling the unit filter and border frame of Claim 1, wherein 1 unit filter medium layer includes a thermoplastic flow-through facing and synthetic stiffener.
12. The method of assembling the unit filter and border frames of Claim 1, wherein said filter medium layer and border frame are of rectangular shape, said compressing of filter edges and said thermobonding of facing edges of said filter

medium and said border frame being accomplished in at least two steps on a moving assembly line by pairs of spaced opposed edge compressing and thermobonding tools, one pair of which is in-line with the axis of movement of said facing edges and the other pair of which is normal to said axis of movement.

13. A method of assembling a selectively sized and rectangularly configured pleated unit filter and a compatibly configured border frame which filter medium incorporates at least one layer of up to 100% by weight melt blown fibers of approximately 0.3 to 35 micrometers and which includes a thermoplastic flow-through facing and a synthetic stiffener; the method comprising:

heat softening the pairs of opposed edges of said rectangular filter medium with suitable heating in the temperature range of 150°F to 525°F;

compressing said opposed heated edges to a substantially flattened form to have a depth/width calculably coordinated with the depth/width of the pleats of the pleated unit filter;

cutting said layered unit filter medium into a rectangular shape;

mounting said rectangular unit filter medium onto a compatibly rectangularly sized selectively layered thermobondable chipboard flow-through border frame unit having inwardly extending edges to receive and support said flattened border edges of said layered unit filter medium in facing relationship therewith;

ultrasonically welding said facing edges at a frequency of approximately 20 kilohertz (khz), said ultrasonic welding being accomplished on a moving assembly line with thermobonding varied spacing gaps in the range of approximately 0.05 to 0.3

inches, said compressing of said layered filter medium edges and said thermobonding of said facing edges being accomplished in at least two steps by respective pairs of spaced opposed edge compressing and ultrasonic thermobonding tools one pair of said ultrasonic tools being in line with the axis of movement of said facing edges and the other pair of aid ultrasonic tools being normal to said axis of movement.

14. The method of claim 13 wherein said step of compressing said opposed selected edges includes compressing said edges such that said edges have a depth/width less than the depth/width of the pleats of the pleated filter medium.

15. The method of assembling the unit filter and border frame of Claim 13 wherein said step of compressing comprises compressing said edges to form said border edges such that said border edges have a depth/width less than the depth/width of the pleats of said pleated unit filter medium.